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ABSTRACT

Provision of needed services to handicapped preschoolers in rural areas presents major challenges, primarily because of the lack of trained personnel. Federally-funded Project Hi Tech trained teaching staff of two preschools, one of them located almost 200 and the other over 300 miles from Utah State University, by using two-way audio-video telecommunications supported by more common forms of communication including telephone and electronic mail. The microwave signal transmission system utilized the existing state network with the addition of 23 gigahertz microwave radios at the two preschool sites. Other equipment included uni-directional and mobile microphones, broadcast-quality and home video cameras, standard television receivers, the Special Net data-base, and speaker phones. Training techniques utilized coincidental and microsession teaching, the "Let's Be Social" curriculum for handicapped children, and a planning procedure for determining training content. Data indicated that interactive, televised classroom sessions did provide consultants with sufficient information to formulate individual training plans for rural teachers and that rural teachers could follow the plans. The resultant procedures were effective in helping children acquire skills. Few difficulties were incurred due to hardware malfunction; only 4 of 58 scheduled training sessions had to be cancelled due to equipment failure. (NEC)

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INSERVICE TRAINING VIA TELECOMMUNICATIONS: ALMOST LIKE BEING THERE

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Inservice Training via Telecommunications: Almost Like Being There

The provision of needed services to handicapped preschoolers in rural areas presents major challenges. One problem is the lack of trained personnel (Hutinger, Kutcher, Smith-Dickson, & Hanners, 1981). In many areas, there are no certified teachers for the handicapped preschool population. The teaching role often falls on persons with little or no training in special education. Similarly, although children may need the services of specialists such as speech therapists, physical therapists, and occupational therapists, there may be no available specialists in residence.

In an attempt to "make the best of it," experts may be called upon to travel to rural sites to provide training to local staff and perhaps services, such as evaluation, to handicapped children. Since travel to rural sites can often entail long distances, productive time is lost in travel and the costs are expensive. The result is often that site visits are made infrequently, hindering the amount of training and service that can be provided and limiting or preventing effective follow up. Therefore, staff skills remain undeveloped, and child progress is impeded.

The purpose of this paper is to describe training conducted with rural teachers of handicapped children by the staff of a federally-funded project, Hi Tech. The Project was awarded to the Outreach, Development, and Dissemination Division of the Developmental Center for Handicapped Persons, Utah State University, Logan, Utah. To train rural educators, staff used two-way audio-video telecommunications supported by more common forms of communication, including the telephone and electronic mail. Specifically, Project staff provided training and follow up using interactive television to the teaching staff of two preschools, one located in Ephraim, Utah, some 196 miles from the training site in Salt Lake City, and another one in Cedar City, Utah, located 331 miles from Salt Lake. The paper will describe three components of the project. The first component is the hardware or telecommunications equipment. This section will describe what equipment was necessary to permit simultaneous communication between the trainers and classroom staff. The second component is the "software" or the training provided to preschool staff. Since this is the critical component, it is the major focus of the paper. Evaluation is the third component. A description of observed changes in teacher and student performances coinciding with training will be presented.

Hardware

This section of the paper describes the equipment that was required to allow training staff in Salt Lake City to observe and talk to teachers and children in their classrooms in Cedar City and Ephraim via television, and,

simultaneously, for the teachers to see and talk to the trainers via television. The mountainous terrain of Utah is conducive to the use of a microwave signal transmission system. The State maintains a network of sites having the necessary equipment to receive and broadcast audio and video signals. These sites are in public buildings, such as on university campuses, but are not in preschool classrooms. Therefore, equipment was needed to send the signal directly into classrooms. For the Cedar City site, hardware was positioned in three places. The KUED public television studio in Salt Lake City, where trainers were located during transmission, was one. From there, the signal was sent to a permanent microwave transmission site located on the campus of Southern Utah State College. From the college, the signal was beamed approximately 2 miles to a 23 gigahertz microwave radio located on top of the Project Passage Preschool. The video signal from the preschool in Cedar City to the studios in Salt Lake City traveled back via the same pathway.

To transmit to and from the preschool in Ephraim, the signal was carried via the microwave system between the KUED studio to the permanent station on the Snow College campus. Buildings on the campus are connected with a cable system, so a modulator-demodulator was used to translate the signal from the microwave to a cable signal, which carried it to the preschool. The signal originating at the preschool was transmitted in the same manner to the studio in Salt Lake City.

The equipment necessary to produce the audio and video signals in the studio and in the classrooms was relatively simple. In Cedar City, two standard uni-directional microphones were connected to a microphone mixer. The audio signal travelled along the microwave pathway on a line separate from the video line. In Ephraim, a mobile microphone was used. The teacher attached the microphone to her clothing and could then move around the room.

The cameras and monitors varied from site to site. Both the KUED site and Ephraim sites used commercial, broadcast-quality cameras. However, in Cedar City, a consumer-quality, home video system was used, and the quality of the signal generated was more than adequate for training purposes. The two rural sites used standard television receivers.

Other forms of two-way interaction included electronic mail and teleconferences. When session agendas were in need of clarification, negotiation could be carried out through an electronic mail system, Special Net. Special Net is a large electronic database used mainly by people involved in the field of special education. The staff at Cedar City had access to a computer with a modem. The same was available to personnel at Utah State University. A message from the University could be sent from the computer to the database. The staff in Cedar City, at their convenience, would then access the database and retrieve the message. When they needed to respond, the procedure was reversed, and staff in Logan received information from Cedar City.

Group conferences were often held over the telephone. Speaker phones were attached to the telephones at each site. Several people could then share a telephone, and all parties could hear the conversation. This proved efficient when decisions involving input from more than one source needed to be made.

"Software"

The "software" part of the training system could be defined as the method used to deliver information. The traditional method for teaching over a telecommunications system is expository lectures (Chu and Schramm, 1968), primarily because it is easy to use conventional television, requiring only one-way transmission capabilities but permitting no interaction between trainer and trainee. With two-way communication extending into the trainees' classrooms, instructional approaches can vary. The trainee can ask questions. The trainer can observe as the trainee works and can provide performance feedback. The trainer can model for the trainee. Thus, two-way audio-video communication facilitates interactive instruction, which is virtually the same as having trainer and trainee in the same location. The "software" in this project included two methods of instruction (coincidental teaching and microsession teaching), a curriculum for handicapped children, the Let's Be Social program, and a planning procedure for determining training content. Examples of how Project trainers helped preschool teachers to use these methods and the program are given below.

Coincidental teaching. Coincidental teaching is the process of inserting short, individual instructional contacts into ongoing instructional settings. It was suited to the needs of a teacher in Cedar City, because two handicapped preschool students' shared goal was to become more interactive with other children. Project staff suggested that the teacher plan and include into regularly occurring activities opportunities which would promote interactions between this child and his classmates. One plan took place during an art activity where the children cut and colored pictures. To include coincidental instruction in social interaction into the art activity, it was decided that the teacher would assign another child to be in charge of crayons, scissors, and paper. The other students at the table were then required to ask the student-in-charge for the items. Thus, in one learning situation, cutting and coloring, the target child was to be taught to interact with other children in the group, since he couldn't complete the main assignment without asking for needed materials. The teacher's part was to casually observe the group, tell the child how to ask if he did not spontaneously request materials, and praise the children for interacting. Project staff observed the project teacher as she conducted sessions over a period of several weeks, gave her suggestions about her techniques, and helped her to extend the teaching to other situations.

Microsession. Microsessions are one-on-one teaching situations. A microsession incorporates systematic direct instruction tactics. An example of a typical microsession conducted at the Ephraim site illustrates the concept. The teacher had been working for some time to teach a child to write his name. The teacher and consultant from the Hi Tech staff designed a different lesson plan. The lesson began with a probe during which the teacher gave the child a paper with a box for each letter of the child's first name. Above each box, she had written the letters which the child would try to write inside the box. The probe began with the teacher directing the child to write his name in the boxes. She gave no other direction or prompt until the student had completed the probe.

The teacher then examined the probe and selected a letter for the child to practice. She would then model the letter for the student by writing it above the box. The student was then directed to write the letter inside the box. This procedure was repeated for a certain number of trials.

Upon completion of the lesson, the student returned to other activities. The teacher held the work up to the camera for the consultant's examination. They discussed the child's work and the teacher's fidelity in following the plan based on the consultant's observation of the session. While observing sessions, the trainer always recorded specific teacher behaviors based on the prearranged teaching plan. These data served as the basis for feedback about the teacher's behavior. Together, the teacher and trainer planned the next session. Their plans included teaching targets for the teacher as well as specific objectives for the child.

Let's Be Social. Let's Be Social is a program designed to teach low-interacting children motor and verbal responses to social encounters. There are 26 units, each intended to teach a different social skill. The lessons begin with teacher-directed group activities. Practice is made available through coincidental teaching, and, when possible, families are encouraged to participate.

In collaboration with Site staff, Project staff decided to use four of the 26 lessons during the course of training. Target children were selected on the basis of teacher nomination and observations of their interactions with peers and assessed. The site staff were then trained to use the lessons by having them: (a) read the "Teacher's Guide" for each lesson, (b) teach the lesson while the trainer observed via television, (c) discuss their teaching behaviors with the trainers after the session, and (d) repeat the instruction with suggested modification or proceed to a new lesson as warranted by the teacher's instructional techniques and the children's skill mastery.

Planning procedure. Sessions were planned initially by telephone. Some planning was conducted, as described above, over two-way television at the end of each session. In Cedar City, plans were confirmed when days elapsed between training by using electronic mail. The Project staff sent agendas for each session to Cedar City via Special Net. The staff in Cedar City accessed the database and retrieved the agendas at their convenience. They could make any necessary changes and send a reversed agenda to the trainers if necessary. A typical agenda is shown below:

1:30 Sharman will overview the agenda.
1:31 Discuss with Debbie Jensen the plan for coincidental teaching.
1:35 KUED will observe as Ben and Jeremy are taught coincidentally. There will be no feedback on this session. KUED will need to confer. Feedback will come on the next session.
1:50 Observe Debbie Davis teaching "Let's Start Talking" Day 4.
2:05 KUED confer
2:07 Kris will provide feedback to Debbie Davis.
2:10 KUED will discuss the feedback process with Kris.
2:15 Plan next session.
2:30 Off Air

Transfer of trainer role. As the training progressed, steps were taken to transfer the trainer's role to local personnel. Instead of the Project staff providing feedback to the teacher, the teacher's supervisor provided the feedback. Project staff then trained the supervisor to observe and give feedback using the observation-feedback alternations originally applied to teacher training. Thus, the role of teacher-trainer consultant could be passed to the site supervisor or to a knowledgeable colleague.

Evaluation

Information was collected regarding the "software's" effect on teacher and student performance. Evaluation of coincidental teaching took place at the Cedar City site. The participants were the teacher and two students. The overall objective of the sessions was to help the two children increase social interaction with their classmates. The teacher designed a lesson plan for each session, presented it to the Project staff, and carried it out. The Project staff observed and collected data during the transmission. Videotapes of both Project staff and the classroom were recorded for evaluation purposes.

Three variables were measured: (a) The number of target children's interactions in a 10-minute session; (b) teacher prompts to the target children; and (c) teacher praises for interacting. Training sessions were conducted. Data were collected before training began (pre), one month later (mid), and approximately one week later (post). Child interactions were defined as the target child's engaging in dialogue with a classmate either spontaneously or when prompted by a teacher and/or peer.

Both children interacted more during and after training than they had prior to training. The teacher prompted and praised each child for interacting after training occurred and continued to prompt and praise after training.

Evaluation of the Let's Be Social program was conducted at both sites. Two teachers were from Ephraim, and one teacher was from Cedar City. The sessions were taught in small-group settings of four to six children. In each group, there was one or two children who seldom engaged in social behaviors such as greeting peers, sharing, or engaging in conversation with classmates. Data were collected from videotapes of the 22 training sessions on teacher prompting and student responses. Prompts were defined as teacher cueing or requesting the student to wave or say hello or goodbye. Child responses were defined as a student's waving and/or saying hello or goodbye.

Increases in both teacher prompts and child responses were observed after training occurred. However, no changes or decreases were observed during training on the days selected for observation.

The microsessions were evaluated from video recordings of the training sessions at the Ephraim site. The teacher followed the lesson plan for the child developed by Project staff. The student's formation of the letters in his name improved during the training period.

Other Training

In Cedar City, the final two training sessions were devoted to using the two-way television to assist a special education teacher in providing language help to a child. The first session involved assessment of the student. Prior to the session, the therapist and teacher planned the procedure. During the session, the classroom teacher asked language assessment questions as the therapist observed via television. When the student responded, the therapist collected data. Following the initial assessment, the therapist explained and demonstrated procedures intended to increase the child's use of language.

A follow-up session was scheduled two weeks later. In the follow-up session, the therapist directly assessed the child on some assessment items. She said the child's name. When he looked at her on the television screen, she asked evaluation questions and recorded the child's answers. Her final report states that the child had "dramatically improved in overall language skills and appears to be using these skills functionally." Due to the absence of experimental analysis procedures, one cannot attribute this increase to the training. However, the fact that the teacher was able to learn procedures over television and the fact that the child would respond to the "television therapist" suggest the potential for future applications of the technology.

Summary and Conclusions

The telecommunications system seemed to provide a viable approach to providing interactive instruction and consultation to service providers in rural settings. While the data presented here are only suggestive, they indicate that interactive, televised classroom sessions can provide consultants with sufficient information to formulate individual training plans for rural teachers and that rural teachers can follow the plans. The data also suggest that the resultant procedures are effective in helping children to acquire skills.

It should be noted that few difficulties were incurred due to hardware malfunction. Only 4 of 58 scheduled training sessions had to be cancelled due to equipment failure. Had consultants or teachers attempted to travel to each others' sites for training, winter weather alone would have caused many more cancellations.

The results suggest that televised learning and training can allow professional colaboration necessary for the expansion of services in rural areas. Both staff and handicapped clients may benefit. Future applications of the technology will, hopefully, expand the training targets and procedures as well as the database necessary for more conclusive evaluation of the results.

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